Education Data Service pilot: Invitation to Tender

This invitation to tender provides a summary of the EEF and the proposed Education Data Service. The EEF is looking to appoint an organisation to provide the data processing for the Education Data Service and partner with EEF in exploring the optimal way to deliver the service during a pilot phase starting in the summer 2017 and running over at least one academic year.

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BACKGROUND ON EEF

The Education Endowment Foundation (EEF) is an independent grant-making charity dedicated to breaking the link between family income and educational achievement. We do this by identifying promising educational interventions that address the needs of disadvantaged children in English primary and secondary schools, evaluating these to understand what works, and then encouraging schools, charities and government to apply the evidence and adopt successful innovations.

The EEF is funded by a £125 million grant from the Department for Education and intends to commit £200 million over the fifteen-year life span of the foundation. In its first five years the EEF has committed £82 million on 133 education projects working in almost one third of schools and with 860,000 pupils. All of these projects are being independently evaluated by one of the EEF's panel of 26 teams of education and evaluation experts, using robust quantitative methods. Of the 133 evaluations commissioned, 110 are randomised controlled trials, many with a long-term control group built into the design, to enable the EEF to understand the longitudinal impact of its projects.

BACKGROUND ON EDUCATION DATA SERVICE (EDS)

The Department for Education (DfE) has recently conducted a review of EEF's work. As part of this review EEF has been asked to explore setting up an 'Education Data Service' (EDS) that might provide a quick and cost-effective means for education organisation (e.g. charities, groups of schools) to access to estimates of impact on attainment based on samples matched on observable background characteristics. This could provide useful early evidence of promise and could help inform decisions about which projects should progress to EEF trials.

The model is likely to be similar in some aspects to the Ministry of Justice Datalab but will be hosted outside of government by the EEF.[1] The EDS would largely draw on administrative data from the National Pupil Database (NPD) to create the matched estimates of impact, although EEF is exploring whether data from other sources (such as from standardised test providers) could be added in.

[1] https://www.gov.uk/government/publications/justice-data-lab

The EEF has conducted a scoping phase to explore how the service fits within the existing impact evaluation landscape, the needs of potential users, and how to make the service as useful and robust as possible. EEF is now intending to commission a pilot phase to further develop the service and test it with a small number of early adopters. Some of the issues explored in the scoping phase and more detail on what we are hoping to achieve through the pilot phase are outlined below.

EDS NEED

Existing impact evaluation landscape

There are lots of existing routes to evaluating impact in education, from high cost, relatively high-security EEF evaluations and commissioned quasi-experimental (e.g. propensity score matched (PSM)) designs, through to low-cost, lower security approaches that tend to be used by schools such as comparing to national averages or similar schools (see Figure 1). The EDS could potentially fill a gap by enabling low-cost, relatively high-security impact estimates for charities and groups of schools. It is intended that the pilot will provide further information on the amount of resourcing and time required to deliver educational impact estimates via the EDS, as well as how it could be used by EEF, policy-makers and practitioners (see section on Purpose below).

Figure 1: Where the Education Data Service might sit within the existing landscape for evaluating educational impact
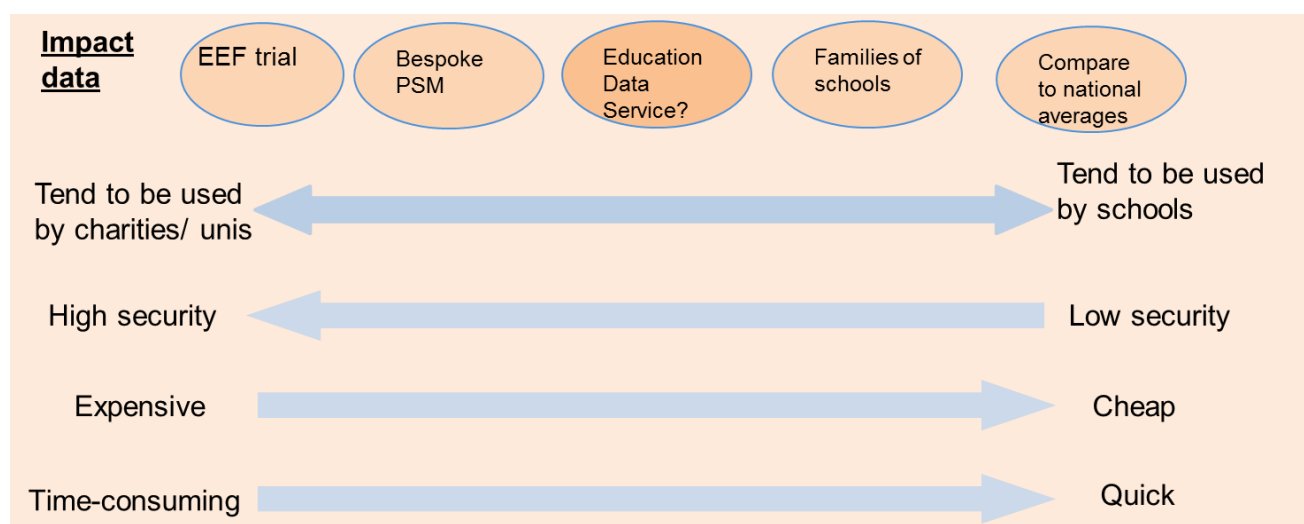
Potential users

EEF has conducted an analysis of potential service users, based on the applicants to its tenth round of funding. The funding round had 228 applicants, which is similar to other funding rounds. Of these 228 applicants, 83 were potentially scalable and educationally-interesting but were not taken forwards due to a lack of prior evidence. These 83 applicants are potential users of the EDS. This sample of 83 applicants were analysed to better understand their needs and the implications for a service that could meet those needs. Appendix 1 gives more detail on the analysis. The main findings are that:

1) **The EDS will need to include additional data to that held in the NPD if it is to be relevant to those organisations working in the early years, KS1, KS3 and with non-attainment outcomes** such as social and emotional skills. It was estimated that 45% of the 83 applicants would be excluded from the service if it just contained NPD data.

2) **Many potential users of the EDS would need to collect new data and the EEF will need to clarify minimum sample requirements.** Only 26% of applicants had reached 20 or more settings to date and appropriate consent is unlikely to have been collected from participants.

3) **The biggest challenge for the service will be modelling the selection process at the level of setting, deliverer and participant.** Applications included those for whole-school programmes, teacher-training, targeted and out of school hours approaches such as parenting programmes. Recruitment will have occurred at different points and 60% of applicants were delivering targeted approaches many of which cite multiple factors combined with professional judgement to identify participants.

EEF is interested in working closely with the piloting partner to address these challenges for the EDS.

EDS PURPOSE

The results coming out of an EDS could potentially be used in two ways:

1) **Internally by EEF in order to inform its grant-making decisions**. EEF has two rounds of funding per year via an open application system. It decides whether to fund an education intervention based on the programme being scalable, educationally interesting and having evidence of promise either because it has been evaluated previously, or because it draws on evidence-based educational theory. Many applications that are scalable and interesting are not taken forwards because of a lack of prior evidence. The EDS could potentially provide early evidence of promise that might mean some of these interventions could be taken forward to be tested more rigorously through an EEF efficacy or effectiveness trial.

2) **Externally to provide evidence of impact**. The results of the EDS could also be published on EEF's website, with some discussion and interpretation, to provide early evidence of educational impact. These results might supplement the evidence being provided by EEF RCT evaluations and be used by schools to determine how they spend their budgets.

However, both of these uses carry risks. The literature is currently sparse on the performance of non-experimental estimates on evaluating school-based interventions. EEF has commissioned an analysis using it's archived of RCT data to provide 'within study comparisons' to non-experimental estimates, to provide further evidence on this question (see Box 1). It is hoped that this analysis will provide evidence on the performance of non-experimental estimates at providing unbiased estimates of impact, and therefore on the extent of risk from the EDS biasing in an unknown way 1) EEF's grant-making and 2) practitioners' and policy-makers' decision-making (if the results are published online), and how to mitigate those risks. It is intended that the pilot will also contribute to EEF's thinking on this issue.

Box 1: Using RCTs to assess the value of observational studies in the English school system

On completion, all data from EEF efficacy and effectiveness trials are submitted to EEF's archive, managed by FFT education. The EEF archive currently contains data from 54 published efficacy and effectiveness trials and this data is linkable to the National Pupil Database via unique pupil identifiers. EEF is supporting a piece of analysis that will produce a within-study comparison on approximately ten high-security trials (based on three or more padlocks using EEF's security rating system*) that have used Key Stage attainment data as an outcome. The RCT estimate will be compared to 18 non-experimental matched estimates from the NPD. The analysis intends to answer three main questions:

1) What is the distribution of selection bias, conditional on observables, across a range of school-based interventions in England?
2) What are the characteristics of school-based interventions that are associated with lower selection bias, conditional on observables?
3) What features of non-experimental studies are most effective at re-capturing experimental estimates?

This will result in a significant contribution to the literature on the performance of non-experimental estimates in producing unbiased estimates of impact in educational settings. It is intended that this analysis and a report of the results will be completed by the end of the summer 2017.

*https://educationendowmentfoundation.org.uk/public/files/Evaluation/Carrying_out_a_Peer_Review/2015_Classifying_the_security_of_EEF_findings.pdf
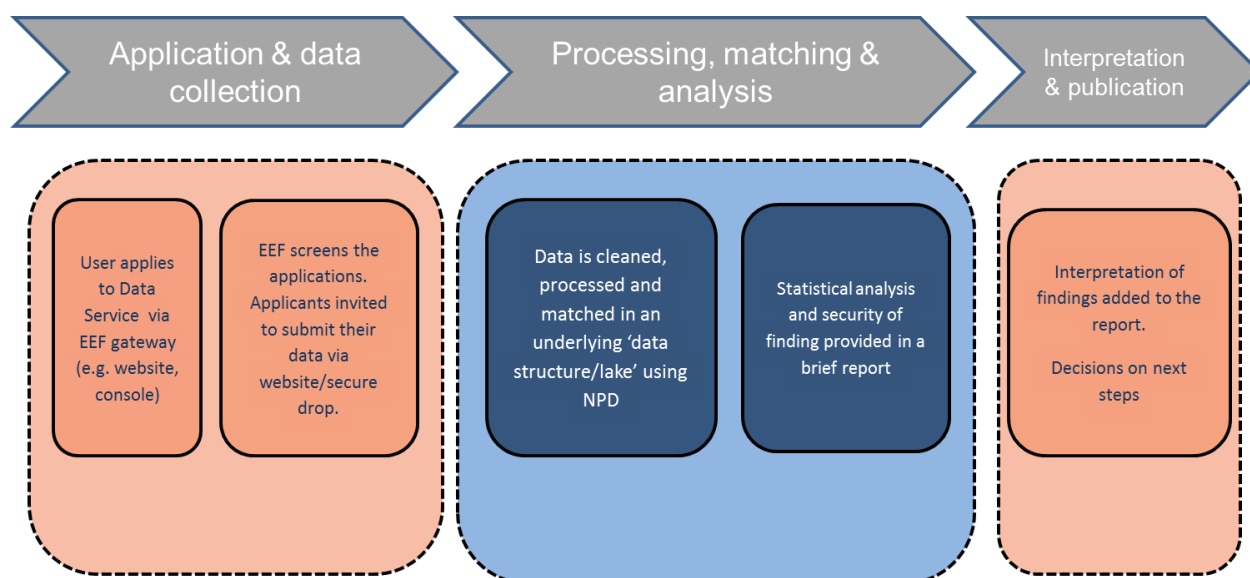
OPERATING THE EDS

During the scoping phase EEF has been in conversation with providers of similar services including the Ministry of Justice Datalab, and UCAS' data matching service (called STROBE) and other experts about the optimal way to deliver the EDS. It is anticipated that there will be three main phases involved in operating the service (see Figure 2):

1) **Application and data collection:** Applicants apply to the service via a gateway, applications are screened and data submitted.
2) **Processing, matching and analysis:** Data is cleaned and processed, matched to the NPD, an estimate of impact is created using non-experimental designs and a brief report of the outcomes is produced.
3) **Interpretation and publication:** Interpretation of the findings added to the report and a decision is made about next steps.

The EEF has considered whether it would be more effective to deliver the service in-house or fully commission it out. EEF is currently proposing a hybrid operating model, whereby it will commission out the second part of the process to a partner withthe necessary IT, data security infrastructure and skills. However, EEF is interested in remaining closely involved in the screening of applications and interpretation and (possible) publication of the results. Although only the middle part of the process will be commissioned out it is intended that the delivery partner would work closely with the EEF to optimise the first and third aspects of the process. The pilot is intended to explore how best to manage the operation of these three phases.

Figure 2: A hybrid operating model for the EDS

Application & data collection	Processing, matching & analysis	Interpretation & publication
User applies to Data Service via EEF gateway (e.g. website, console) / EEF screens the applications. Applicants invited to submit their data via website/secure drop.	Data is cleaned, processed and matched in an underlying 'data structure/lake' using NPD / Statistical analysis and security of finding provided in a brief report	Interpretation of findings added to the report. Decisions on next steps

DATA ACCESS

EEF has been in conversation with the DfE and other data holders, including standardised test providers, about the data service. As discussed, EEF is interested in creating an underlying data structure that will enable the service to provide impact estimates at times other the end of KS2 and KS4, and with the aspiration to eventually include outcomes other than attainment.

Access to the National Pupil Database (NPD)

The Education Data Service would be a solely EEF-branded enterprise, as opposed to being hosted in government, like the Ministry of Justice datalab. The DfE have agreed that the EEF (or their processing partner) would be given access to pupil-level NPD data probably via a change to the DfE privacy notice to ensure data subjects are aware of how their data is being used. DfE will provide support to ensure that the relevant security and legal data sharing standards are being adhered to.

Access to standardised test data

EEF have met with a number of organisations which provide standardised tests to schools. Most of the test providers that we met with are open to the idea of working with the EEF and providing data to the EDS. In all cases this will require a change in their data sharing agreements with schools. EEF anticipates having a high set of minimum standards for tests to be accepted into the EDS, including standards around:

- Reliability
- Validity and correlations with national test performance
- Minimum samples size and reach

In all cases the tests will need to be linkable to the NPD. EEF anticipates having a 'preferred test' for each outcome and age group based on the quality criteria, but hopes that eventually the EDS could include test data from multiple providers with tests that meet these criteria. During the pilot phase, conversations with test providers will progress and it is hoped that data from at least one provider can be added to the service as a test case during the pilot phase.

THE PILOT PHASE

As discussed above, EEF is looking to tender out the middle part of the operating process (processing, matching and analysis) during the pilot phase. As well as delivering the middle phase of the EDS operation

during this pilot phase, EEF is looking for a partner who will also be able to actively work with EEF to provide advice and explore the issues discussed above, including:

- What is the most efficient way of resourcing the EDS? How can we maximise the number of estimates of impact that it could deliver in a given year?
- How can the EDS be delivered in such a way that minimises the risk that results from the EDS bias either EEF's grant-making decisions or practitioners and policy-makers decision-making?
- What is the optimal way of modelling the selection process that applicants go through when delivering their programme within the EDS?
- What is the optimal way that EEF can work with data processing partner to operate the EDS?
- What are the challenges and solutions in adding in non-NPD data to the EDS?

Technical questions

In addition to the issues outlined above, there are a host of technical questions that will need to be explored during the pilot phase, some of which have been touched on above, for example:

- What are the minimum requirements for someone applying to use the service? (Including, for example, the types of programmes or interventions (which might be the same as EEF's grant-making criteria or include additional requirements) and minimum sample requirements at the level of school and participants.)
- How should data be submitted in order to make the process as efficient as possible?
- What is the optimal matching process? How does this vary by programme type? (It is hoped that the archive analysis (see Box 1) will contribute to this).
- How should EDS communicate the security of findings to practitioners? How should this be linked to EEF's padlock rating system and what criteria need to be considered?

Some of these questions will be answered through literature review, conversations with experts and statistical modelling, some through discussion and development of practical processes. EEF will work with the winning bidder to specify an agreed list of questions that will need to be answered during the pilot phase and how they will be evidenced.

Early adopters

EEF anticipates that EEF and its partners will work with a small number (the optimal number to be determined) of early adopters during the pilot phase. These applicants are likely to be selected from the pool of recent applicants to the EEF (see Appendix A for analysis of applicants that could be eligible) and would include applicants with a range of school-based interventions delivered at different levels (e.g. universal and targeted approaches). We would also want to identify some applicants who have worked with a large number of settings and already have data on their users that could be immediately analysed using the service, as well as some applicants who will have to start collecting new data in order to use the service. Most of these early adopters will need to be working with pupils at the end of KS2 or KS4, although we could explore including some applicants working at other stages if we are successful in adding in standardised test data to the EDS during the pilot phase.

Exploring how users interact with the service

In addition, EEF is interested in commissioning during the pilot phase some mixed-methods process evaluation to explore how users of the service interact with the application process and report outputs. In particular, EEF is interested in understanding how it could structure its application process in order to minimise selection bias. This will require us knowing, for example, how applicants go about selecting samples to submit to the EDS. EEF is also interested in understanding how applicants interact with the results of their findings, and how much

support will be required at the end of the process in supporting applicants and practitioner or policy-maker audiences to interpret results appropriately.

This piece of mixed-methods process evaluation could be commissioned from the pilot partner, if they have the skills within their organisation, or could be commissioned independently.

Timetable

The length of the pilot phase is not set, but EEF anticipates it completing within a maximum of two years. The following is the approximate timetable we anticipate following:

- February 2017: ITT opens.
- By Mid-March 2017: preferred partner identified
- March 2017: Final sign off from the EEF board of trustees on the pilot phase budget
- April 2017: pilot partner tender awarded
- May 2017: Work begins on setting up the pilot EDS
- By September 2017: Pilot year begins, applications are open
- September 2017 - 2018: EEF develops the process with early adopters, data processor and advisory group with the intention of expanding the offer in September 2018.

INVITATION TO TENDER FOR THE PILOTING THE EDS

The EEF is inviting tenders to deliver the data processing for the Education Data Service and partner with EEF to explore the optimal way to deliver all elements of the EDS. The tender should include:

- Experience of data matching and creating non-experimental estimates of impact.
- Experience of working with educational organisations.
- Experience of using the National Pupil Database.
- Any other relevant experience.
- Discussion of the issues that the data management task presents and how they should be addressed.
- Key team members.
- A budget for the work broken down as far as possible and with all assumptions clearly articulated. We realise that the budget may change after the pilot partner is appointed and the task becomes more closely specified.

Proposals should reach the EEF by **5pm on Friday the 10th of March**: camilla.nevill@eefoundation.org.uk

If you have any questions regarding the ITT please submit them by 5pm on Friday the 24th February.

The following graphs are based on the coding of 83 applicants' application forms to EEF's tenth round of grant funding whose programmes were judged to be scalable, educationally-interesting, but lacking sufficient evidence of promise to be taken forwards for an EEF evaluation. It should be noted that although this was a general funding round, the application form identified that EEF was particularly interested in early years, subject-specific teaching and literacy programmes in the North East, so the analysis is biased towards these types of programmes.

Most applicants are from charities and schools and only 6% of the 83 applicants were from Universities. This is because most University applicants have some evidence of promise from a previous evaluation (see Figure 1).

Figure 1: Applicant organisation type (N=83)
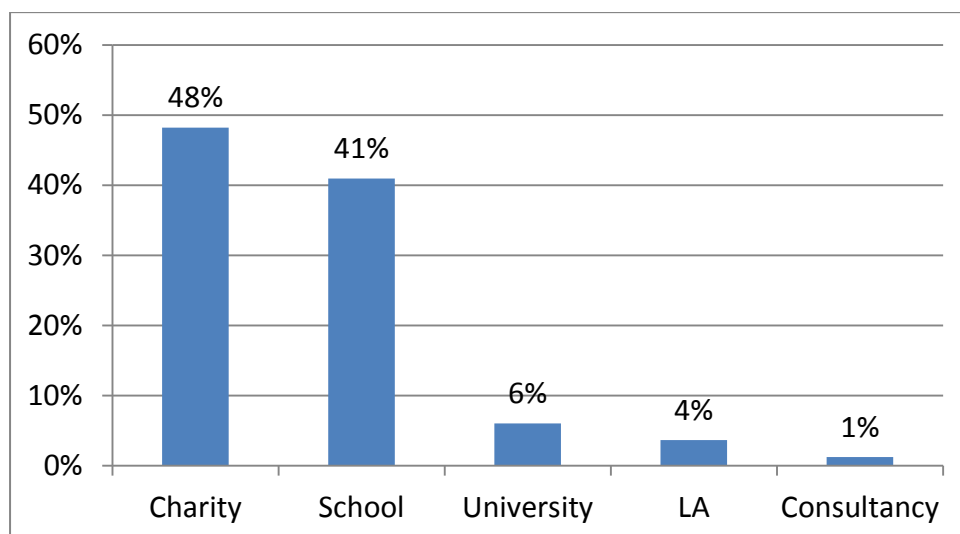
Just over a third (35%) of applicants work in more than one Key Stage and 53% of projects work in either KS2 or KS4 (see Figure 2). Most applicants were flexible and worked across most of the years within the Key Stage identified.

Figure 2: Percentage of projects working in that Key Stage (N=83)
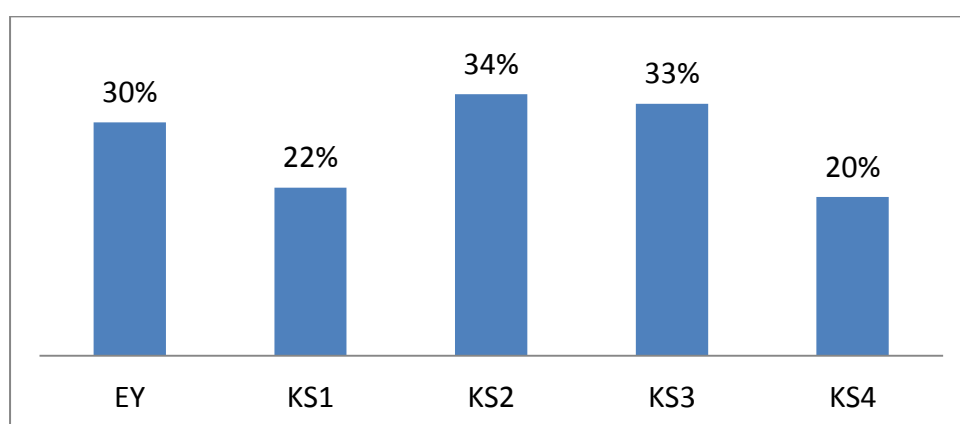
The most commonly identified outcome was literacy or language. Only a quarter (23%) name one outcome, 42% name two outcomes, and 30% three or more outcomes in their application form (see Figure 3). It was estimated that 55% of applicants could use the NPD as an outcome - based on them working in KS2 or KS4, and having identified attainment as an outcome - or working in KS1 or KS3 and having identified exclusion or attendance as an outcome.

**Figure 3: Percentage of projects by main outcome identified (N=83)**
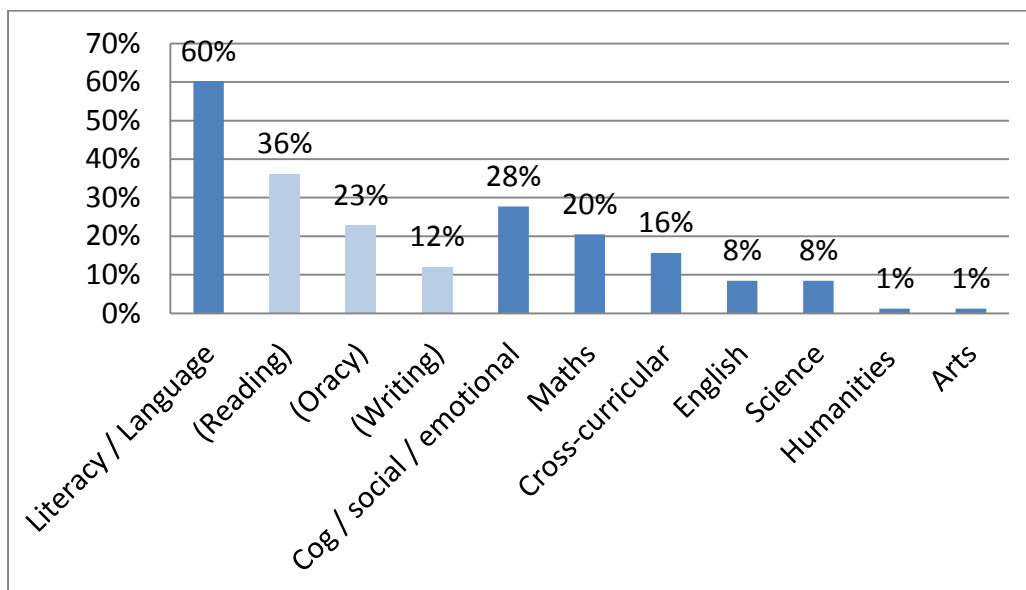
Of the 37 projects (45%) that would be excluded from a service that just included NPD data, 75% are in the early years or KS1 and 22% are in KS3. In addition, 23 projects (27%) name a non-attainment outcome. Various non-attainment outcomes were identified (see Figure 4). Attendance and exclusion are included in the NPD, but other behavioural and non-attainment outcomes will require standardised tests to be added to the service.

Figure 4: Number of applicants by the non-attainment outcome identified (N=23)
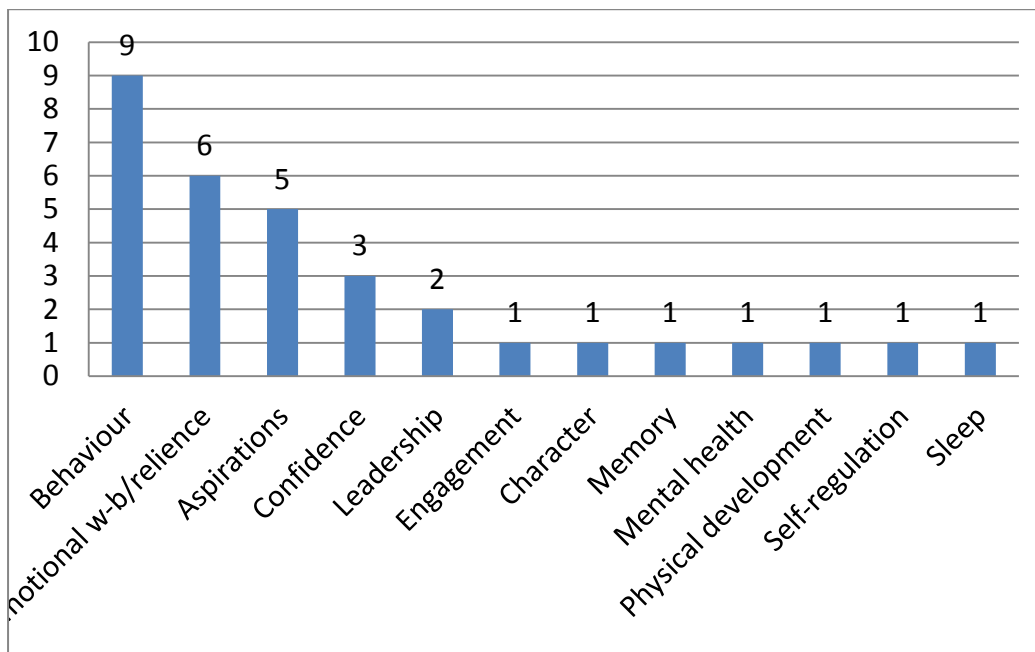

Two-fifths (40%) of applicants' programmes are available either locally or nationally and three-quarters (77%) of applicants have reached one setting or more. Of those that are unavailable, over half of the applicants are schools. Only 26% of applicants have reached more than 20 settings (see Figure 5). It should be noted that 4 applicants were excluded where it was difficult to translate participants into settings.

Figure 5: Percentage of projects by number of setting reached (N=79)
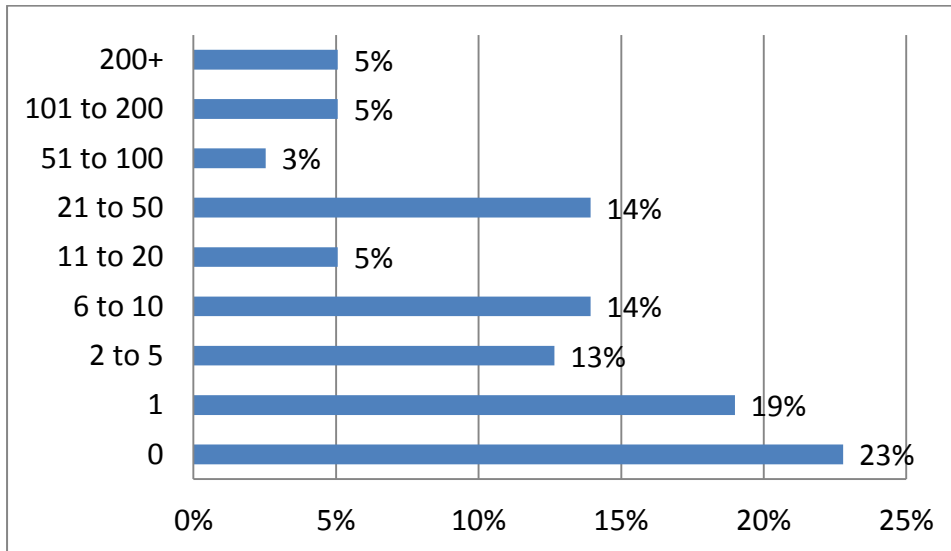
Half of applicants' projects involve staff development and will require recruitment of teachers and just under a fifth (18%) of projects involve the recruitment of parents (see Figure 6). Most projects are less than a year in length with only a quarter (23%) being longer than a year.

Figure 6: Percentage of projects by main activity (N=83)
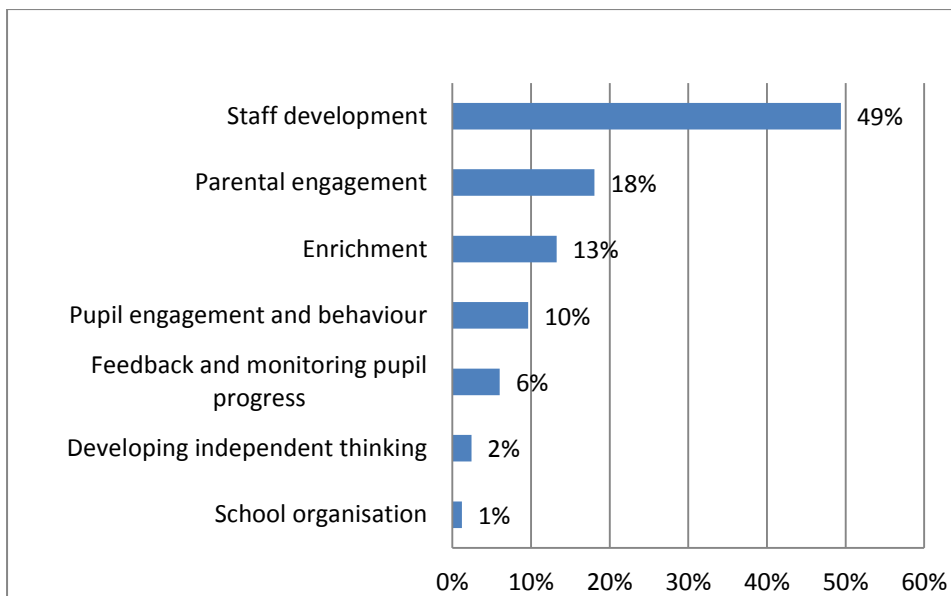
Of the 83 applicants, 60% applied with projects that are targeted within the setting, compared to 40% that are described as universal. Of those 50 targeted programmes, many cite multiple factors that are considered in deciding whether to offer a programme to a participant. They also often cite professional judgement as an important factor in deciding who should participate. The most common targeting factors identified are poor literacy, disadvantage, and poor language (see Figure 7). Only some of the factors identified have corresponding data in the NPD that could be used to identify the target group.

Figure 7: N of targeted projects by described target group (N=50)